

Application No. 10/035,861  
Amdt. Dated February 28, 2006  
Reply to Office Action of October 28, 2005

### **REMARKS/ARGUMENTS**

#### **1. Response to the Rejections of Claims 1-4, 6-16 and 18-25 Based Upon 35 U.S.C. §103(a)**

Claims 1-4, 6-16 and 18-25 stand rejected under 35 USC §103(a) as being unpatentable over Drmanac et al (US Patent No. 6,297,006) and in view of Muller et al. (U.S. Patent No. 5,804,384). This rejection is respectfully traversed.

A determination under 25 U.S.C. §103 is whether the claimed invention as a whole would have been obvious to a person of ordinary skill in the art at the time the invention was made. *In re Mayne*, 104 F.3d 1339, 1341, 41 USPQ 2d 1451, 1453 (Fed. Cir. 1997). An obviousness determination is based on underlying factual inquiries including: (1) the scope and content of the prior art; (2) the level of ordinary skill in the art; (3) the differences between the claimed invention and prior art; and (4) the objective evidence of nonobviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18, 148 USPQ 459, 467 (1966), see also *Robotic Vision Sys., Inc. v. View Eng'g Inc.*, 189 F.3d 1370 1376, 51 USPQ 2d 1948, 1953 (Fed. Cir. 1999).

In line with this standard, case law provides that "the consistent criterion for determination of obviousness is whether the prior art would have suggested to one of ordinary skill in the art that this process should be carried out and would have a reasonable likelihood of success, viewed in the light of the prior art." *In re Dow Chem.*, 837 F.2d 469, 473, 5 USPQ 2d 1529, 1531 (Fed. Cir. 1988). The first requirement is that a showing of a suggestion, teaching or motivation to combine the prior art references is an "essential evidentiary component of an obviousness holding." *C.R. Bard, Inc. v. M3 Sys. Inc.*, 157 F.3d 1340, 1352, 48 USPQ 2d 1225, 1232 (Fed. Cir. 1998). This showing must be clear and particular, and broad conclusory statements about the teaching of multiple references, standing alone, are not "evidence." *In re Dembiczak*, 175, F.3d 994, 1000, 50 USPQ 2d 1614, 1617. The second requirement is that the ultimate determination of obviousness must be based

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on a reasonable expectation of success. *In re O'Farrell*, 853 F.2d 894, 903-904, 7 USPQ 2d 1673, 1681 (Fed. Cir. 1988); see also *In re Longi*, 759 F.2d 887, 897, 225 USPQ 645, 651-52 (Fed. Cir. 1985). The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification. *In re Fritch*, 972 F.2d 1260, 1265, 23 USPQ 2d 1780, 1783-84 (Fed. Cir. 1992).

The examiner has the burden of establishing a prima facie case of obviousness. *In re Deuel*, 51 F.3d 1552, 1557, 34 USPQ 2d 1210, 1214 (Fed. Cir. 1995). The burden to rebut a rejection of obviousness does not arise until a prima facie case has been established. *In re Rijckaert*, 9 F.3d 1531, 1532, 28 USPQ 2d 1955, 1957 (Fed. Cir. 1993). Only if the burden of the establishing prima facie case is met does the burden of coming forward with rebuttal argument or evidence shift to the application. *In re Deuel*, 51 F.3d 1552, 1557, 34 USPQ 2d 1210, 1214 (Fed. Cir. 1995), see also *Ex parte Obukowicz*, 27 USPQ 2d 1063, 1065 (B.P.A.I. 1992).

As positively recited in the independent Claims 1, 14 and 24, Applicant's claimed method for detecting multiple test materials in a test sample requires a sequential analysis process in a test column having a plurality of snares which are spaced apart along a longitudinal axis of said column and separated one from another by an intervening air space. Applicant's claimed method includes steps of addition of a test sample, wash solution, a first probe and a second probe into the test column, wherein each of these described liquid materials passes through the plurality of snares from top down. This process allows each snare to be in contact with the same sample, the same probe and the same reagents.

Applicant submits that the claimed subject matter is not disclosed, taught or suggested by the art of record. More specifically, Drmanac et al fail to teach Applicant's claimed method which requires the sequential analysis process in a test column having a plurality of snares which are spaced apart along a longitudinal axis of said column and separated one from another by an intervening air space. On the contrary, Drmanac et al teach their analysis process using membrane to form arrays

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which consist of multiplicity of subarrays of dots, separated by a space between the dots (column 3, lines 64-67; and column 20, lines 28-59).

In Drmanac et al's method each sample has its specific location, i.e., a dot, or a subarray, on the membrane. The sample does not go through all snares (subarray in the prior art), as required in Applicant's invention. Furthermore, the probe and reagent for each subarray are not to be in contact with other subarrays or dots, instead, the probe and reagent are separated by plastic grid, or strips.

Drmanac et al's deficiencies are not overcome by Muller et al.

Muller et al teach an assay device for isolating a plurality of different analytes from a sample. The device comprises a capillary tube containing a linear array of binding elements. The binding elements consist of standard column packing materials, and are stacked directly on top of one another to form a packed column (Column 7, lines 23-53). Muller et al. further teach that inert layers, lacking capture probes, can be placed between the binding elements (Column 7, lines 42-47). However, even with the inert layers, Muller et al. teach the advantages of using a packed column, which has no air space between layers of the binding elements. Moreover, Muller et al. teach to use electrophoretic transport of the sample through the linear array of binding elements.

Muller et al fail to teach Applicant's claimed method for detecting multiple test materials in a test sample with a sequential analysis process, which utilizes a column that has a plurality of snares which are spaced apart and separated one from another by an intervening air space. Applicant respectfully points out that the column used by Applicant's claimed method has substantially different structural characteristics and functions from Muller et al's packed column containing stacked multiple layers of binding elements.

The Examiner states that it would have been obvious to one skilled in the art to modify Drmanac et al.'s method with the step of including a tube containing linear arrays taught by Muller et al to obtain Applicant's claimed invention.

Applicant respectfully disagrees.

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Applicant points out that Drmanac et al.'s method is not combinable with Muller et al's column containing a linear array of stacked binding materials.

Drmanac et al. specifically teach that their DNA identification and diagnostic sequencing process are performed using a plurality of small arrays which are separated by appropriate spacers, and the probes are to be added to each subarray on each of the arrays to be analyzed in parallel (Column 3, lines 64-67, and Column 4, lines 13-31 of the reference). To implement this parallel and simultaneous analysis, Drmanac et al specifically teach several approaches to prepare the DNA arrays with appropriate separations, including using membrane or plates which are partitioned by physical spacers, such as plastic grid molded over the membrane, or hydrophobic strips (Column 20, lines 53-59). To prevent mixing of the probes between subarrays (if no hydrophobic strips or physical barriers), Drmanac et al. particularly teach to firmly press plastic, metal or ceramic grid to the membrane to provide separations (Column 20, line 66 to Column 21, line 2 of the reference). Therefore, the probes and reagents used for each well, spot or subarrays should not be mixed, or in contact with the neighboring wells, spots or subarrays.

On the contrary, Muller et al teach that a sample is mixed with probe and reagents in mixing chamber 20, then the reaction mixture is pushed through the linear array 12 in capillary tube 18 (see Fig. 1 and Column 9, lines 5-25 of the reference). Using Muller et al's device and method, each sample passes all binding elements in the stacked linear array.

If one tried to combine Drmanac et al's method with Muller et al's linear array, as suggested by the Examiner, Drmanac et al's plurality of samples (can be hundreds of them as taught) and the probes would not be separated anymore, and their simultaneous and parallel analysis is no longer possible. Therefore, such a combination would defeat the purpose of the primary reference.

Based on the above analysis, one skilled in the art would not be motivated to combine the prior art teachings to obtain Applicant's claimed invention, without reasonable expectation of success. Furthermore, even if one combines the prior art

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teachings, in the manner suggested by the Examiner, one would not obtain Applicant's claimed invention, because Muller et al do not teach or even imply to use a test column which has a plurality of snares separated one from another by an intervening air space.

Therefore, Applicant maintains that Applicant's claimed invention defined by Claims 1, 14 and 24, are not obvious in view of the prior art of record.

With regard to Claims 2-4, 6-13, 15-16, 23 and 25, as described above, these claims are dependent upon independent Claims 1, 14 and 24. Under the principles of 35 U.S.C. §112, 4<sup>th</sup> paragraph, all of the limitations of each independent claim are recited in its respective dependent claims. As described above, independent Claims 1, 14 and 24 are not obvious in view of the prior art of record, as such Claims 2-4, 6-13, 15-16, 23 and 25 are submitted as being allowable over the art of record.

Accordingly, Applicant respectfully requests withdrawal of the rejection of Claims 1-4, 6-16 and 18-25 based upon 35 U.S.C. §103(a).

## 2. Response to the Rejections of Claims 5 and 17 Based Upon 35 U.S.C. §103(a)

Claims 5 and 17 stand rejected under 35 USC §103(a) as being unpatentable over Drmanac et al (US Patent No. 6,297,006), in view of Muller et al. (U.S. Patent No. 5,804,384, and further in view of Patel et al (US Patent No. 5,945,249). This rejection is respectfully traversed.

Drmanac et al and Muller et al's teachings have discussed above.

The deficiencies of Drmanad et al and Muller et al. are not overcome by Patel et al.

Patel et al merely teach using acridinium dyes for an imaging media.

As described above, since Drmanad et al teach away from Applicant's claimed method, and Drmanad et al and Muller et al are not combinable, one ordinary skilled in the art will not be motivated to further combine Patel et al's dyes with Drmanad et al's method and Muller et al's device to obtain Applicant's claimed invention. Even if one

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tries, in the manner suggested by the Examiner, one would not obtain Applicant's claimed invention.

Therefore, Applicant maintains that Applicant's claimed invention defined by independent Claims 1 and 14 is not obvious in view of prior art of record.

Claims 5 and 17 are dependent claims of Claims 1 and 14, under the principles of 35 U.S.C. §112, 4<sup>th</sup> paragraph, all of the limitations of each independent claim are recited in its respective dependent claims. As discussed above, independent Claims 1 and 14 are not obvious in view of the prior art of record, as such Claims 5 and 7 are submitted as being allowable over the art of record.

Accordingly, Applicant respectfully requests withdrawal of the rejection of Claims 5 and 7 based upon 35 U.S.C. §103(a).

It is respectfully submitted that Claims 1-25, the pending claims, are now in condition for allowance and such action is respectfully requested.

Applicant's Agent respectfully requests direct telephone communication from the Examiner with a view toward any further action deemed necessary to place the application in final condition for allowance.

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Date of Signature

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